Education of undergraduate Animal Science and Zoology students in professional practice - Can we ensure ethical compliance and educational outcomes?

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ABSTRACT

This case study describes the conflicts between the needs of a university animal ethics committee to meet legislative requirements and the pedagogical outcomes for third year undergraduate project students working with animals in an Australian context. The projects undertaken by this cohort are conducted in collaboration with a wide variety of external clients, using a diverse array of vertebrate species and involve many levels of 'invasiveness' or risk. Conflicts are discussed from the perspective of the various parties involved including the committee, academic staff in the role of supervisors, students and external clients. Ways forward are suggested to improve the process but it is clear that education of the committee, academic staff, students and clients is required and that it is essential to ensure open-channels for dialogue and discussion are utilised effectively.

Key words: Animal ethics; animal science education; animal welfare; Animal Ethics Committee; pedagogy; Zoology

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Introduction

Currently the Australian tertiary education sector is in transition as it copes with the government's vision for Australia to become 'amongst the most highly educated and skilled on earth, and in the top group of OECD nations for university research and knowledge diffusion' and includes the expectation that 40% of all 25-34 year olds will hold a bachelors degree by 2024 (Transforming Australia's Higher Education System 2009). At the University Of Western Sydney (UWS) this has translated to a 33% increase in undergraduate student numbers between 2000 and 2010 and a student population with diverse abilities and often little prior exposure to the discipline area before commencing study.

As outlined in Old and Spencer (2011), the university has also experienced a shift in the involvement of animals for teaching from traditional Agricultural degrees to more diverse animal focused degrees. These degrees fall under the umbrella of either a Bachelor of Science degree (from 2012 renamed BSc (Zoology) rather than BSc (Animal Science)) where the animal focus is more ecology and traditionally science based recognising the increased demand for scientific knowledge to protect and care for animals or a Bachelor of Natural Science (Animal Science) degree where students are exposed to a more holistic and applied approach to animal-based studies. This includes the interaction between people and animals in the context of companionship, food production and the increasing pressures placed on wildlife.

Students entering these degrees often have an interest that is broad, encompassing agricultural or companion animals or wildlife. These students are looking for careers as wildlife officers, animal handlers and others, in animal welfare or wildlife organisations as well as agriculture. In addition, as vocations such as veterinary science, dentistry and medicine move to postgraduate qualifications in Australia, first degrees in related areas are also in demand. In the past at UWS animals were used in teaching primarily for agricultural degrees where students are typically drawn from farming families. This is no longer the case.

As well as the changes in student background and destinations, there has also been a pedagogical shift in the expected outcomes of a university education that has been driven by the employment market. Employer survey responses have indicated there is an expectation of graduates to have discipline knowledge, however communication, teamwork, critical reasoning and analytical skills, and knowledge of the industry are ranked of higher importance (Arnott 2011). Thus the tertiary education sector is trying to deliver workforce ready graduates with the view that

these graduates will change careers and need to constantly update their knowledge. Known as graduate attributes, these outcomes are defined as 'the qualities, skills and understandings a university community agrees its students will desirably develop during their time at the institution and, consequently, shape the contribution they are able to make to their profession and as a citizen' (Bowden et al 2000). The graduate attributes often focus on developing lifelong learners, and given the limited recall of knowledge of students and the rapid expansion of information, these skills are essential for professional and personal participation in society (Scoufis 2000).

To address the many changes in higher education requirements, university teaching activities now include authentic learning experiences which allow students to interact with their chosen profession and develop graduate attributes. As outlined by Herrington and Herrington (2006), an authentic experience demonstrates how knowledge can be used in real life in a complex environment and needs to be explored at length over time. Allowing students to 'think like a professional' also has positive learning outcomes for discipline knowledge as students must develop deep understanding and critical thinking skills (Thompson et al 2003).

In this context the staff at UWS teaching into Animal Science/Zoology degrees developed a teaching unit (subject) based on the 'Systems Project' and 'Professional Practice' units first offered in 1995. The units formerly focused on systems thinking and 'real-world' experiences whereby students worked on a project in collaboration with an external client in an area of their career interest. Students were required to develop, plan, conduct, analyse a research project and write a professional report and communicate their research to the client.

In the last two years, the university has additionally been involved in a science curriculum review and as such all BNatSc students now do this third year capstone project. A capstone unit is required in all science degrees whereby it is a final culminating unit taken at the end of a course in which students showcase capabilities and competencies developed during the program (Krause et al 2013). The number of students involved per year is around 120 however this is expected to increase due to demand and changes in government policy as discussed previously. These students are mostly in the Animal Science focus area with a few enrolled in Environmental Management, Environmental Health (mostly external) and Agricultural (called Sustainable Agriculture and Food Science) programs.

The benefits of community engagement in student-learning are numerous, not only does it incorporate 'real-world' experiences and provide students with opportunities to network with professionals in their chosen career areas but it enhances student learning in both oral and written communication, general professionalism and report writing by engaging the students in a professional context. The two units combined over the year offer both a project (design, conduct, write up and oral presentation to a client) and development of skills required in the workforce such as writing resumés and job application letters as well as critical reflection throughout the year. The projects are identified by clients which ensures client engagement and hopefully useful outcomes for all.

Upon commencement of the new BNatSc (Animal Science) degree in 2004 a need to diversify projects from 2006 onwards resulted in a significant change in the type and style of project. The projects have remained client-based but many of the projects are no longer agricultural-based with a human interaction focus. They are now more animal-focused and often require Animal Ethics Committee (AEC) approval through the university.

Table 1 shows typical examples of current projects which include wildlife surveys, development of behavioural enrichment in captive settings and husbandry modifications as well as the types of clients involved. In addition, Figure 1 shows the degree of 'risk' of projects from an animal care and welfare perspective. A rating scale was developed for the purpose of this paper to illustrate the number of projects having no, low, medium or highly invasive activities. It was not used to assess applications at the AEC. Projects with no invasive activities and not requiring AEC approval are designated a risk rating of 1, an example of a project rated at this risk rating includes a survey of road kill along a stretch of road and involves no live animals. Projects with a risk rating of 2, involve projects that involve live animals but pose no risk to the animals such as diurnal bird counts that occur from a distance so as not to interfere with birds at all. A risk rating of 3 is designated to projects involving live animals but are considered relatively low risk. An example of a project at a risk rating of 3 may involve behavioural enrichment projects such as placing treats or 'toys' in an animal enclosure and observing the animal's behaviour. The highest risk rating of 4 is designated to projects that are regarded as highly invasive and include those projects involving changes in diet or euthanasia of the animal. These differing levels of invasiveness and diversity are not unlike those reviewed by AECs normally (Rose 1999).

As these projects often fall under the jurisdiction of requiring AEC approval this has placed strain on the committee, staff and students. This paper discusses the issues regarding the need to gain successful learning outcomes for students, delineating animal care and welfare responsibility between the client and university staff while still maintaining meaningful and beneficial outcomes for the client, all within a very narrow budgetary window. In addition mechanisms for meeting the legislative requirements for AEC approval are also discussed with the view to ease the relationship tensions between all parties.

The problem:

State legislation (New South Wales *Animal Research Act 1985*) protects the welfare of animals involved in research by regulation of research practice and animal supply. This Act makes reference to the 'Australian code for the care and use of animals for scientific purpose' (NHMRC 2013) (The Code), which unifies research animal care in Australia. The Code's aim is to promote ethical, humane and responsible care and use of animals for research and teaching.

Below is an excerpt from the *Animal Research Act (1985)* which defines animal research in Australia.

Table 1. Examples of typical student projects, clients and relative risk. The specific names of clients and research areas have deliberately not included for confidentiality reasons.

Client type	Project	Risk rating
Animal welfare organisation or shelter	People's perceptions of the X welfare organisation	1
Other private organisation	Influences of purchase patterns of horse owners along the east coast of Australia with a specific focus on horse wormers	1
Animal welfare organisation or shelter	Education of the local community about local wildlife and the importance of wildlife corridors	1
Government organisation	Determining road kill hotspots for native Australian mammals in a local area	1
Government organisation	Testing for presence of endangered frogs in the X bypass construction zone	3
Government organisation	Evaluating the X population in the Y national park	3
Wildlife park	Designing optimal nutrition guidelines for X (wildlife species) in captivity	4
Animal welfare organisation or shelter	Keeping the dogs entertained throughout the day	4
Animal welfare organisation or shelter	Improve animal housing standards and enrichment for dogs	4
Wildlife park	Enrichment plan for three juvenile X (wildlife species)	4

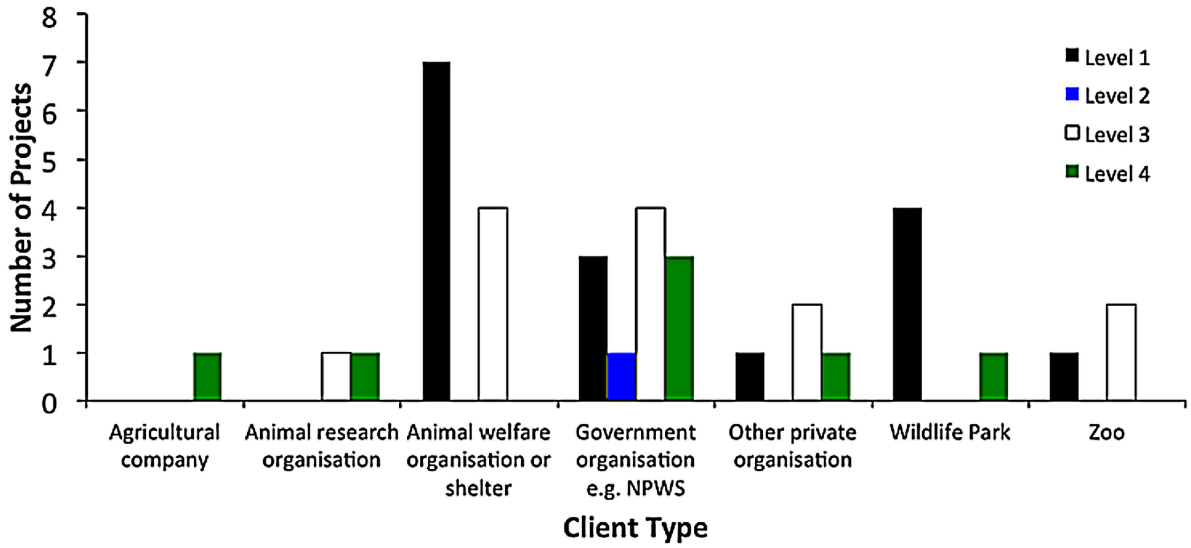

Figure 1 The number of animal-based projects investigated by students in the 2012 cohort, indicating the designated risk level and classification of client.

The interpretation of this statement, together with information in the The Code is assessed by institutional AECs to give authority to carry out a procedure or activity during animal research.

'animal research means any procedure, test, experiment, inquiry, investigation or study in connection with which an animal is used and, without limiting the generality of the foregoing, includes any procedure, test, experiment, inquiry, investigation or study in the course of which:

(a) an animal is subjected to:

(i) surgical, medical, psychological, biological, chemical or physical treatment,

(ii) abnormal conditions of heat, cold, light, dark, confinement, noise, isolation or overcrowding,

(iii) abnormal dietary conditions, or

(iv) electric shock or radiation treatment, or

(b) any material or substance is extracted or derived from the body of an animal, but does not include any procedure, test, experiment, inquiry, investigation or study which is carried out in the course of:

(c) the administration of veterinary treatment to an animal for the purpose of protecting the welfare of the animal, or

(d) the conduct of normal animal husbandry operations.'

In addition, The Code clearly states that:

> *"AEC oversee the care and use of animals in teaching activities (as outlined in 2.3 of The Code) and the teacher has the responsibility of an investigator. In addition "teachers must ensure that students have the opportunity to discuss the ethical and social issues and legal responsibilities of the use of animals in teaching and research".*

From a legislative point of view, the types of activities undertaken in the student projects being discussed here have a strong educational outcome but often the animals are being perturbed beyond that of normal husbandry meaning that they require AEC approval.

The AEC perspective

The UWS AEC has seen increased workload as a result of the increased number of applications and project amendments as student numbers and participants change. In addition, significant numbers of approved projects have not commenced when students have withdrawn from study, frustrating the administration of the committee. The quality of the applications has often been poor given that students and clients have had little experience with committee dealings and the academic in charge of the unit/subject has had large volumes of applications to deal with. Given that the composition of the committee includes lay, other voluntary members and academic staff, this has been a burden at peak times of the year resulting in some members resigning as they feel they cannot spend adequate time on applications.

The applications are also very diverse, as typically the animal usage involves non-UWS based animals. Thus the AEC, like the academics, students and clients sometimes lack skill and knowledge in many aspects of animal research they are being asked to assess. Lunney (2012) has similarly stated for instance, that there is no one animal ethics committee that has knowledge and expertise on all 891 native vertebrates covered by the *National Parks and Wildlife Act 1974*, all which could be potentially involved in projects. In this process, the UWS committee also assesses fish, companion, production and pest species, all of which are not covered under the *National Parks and Wildlife Act 1974* but rather other statutory bodies and legislation. The committee therefore requires a good deal of information to be available in the application with methodologies and requested animal numbers to be articulated very clearly. Like all applications, these student projects are scrutinised for justification of animal use which involve evaluation of educational and research outcomes and looking for opportunities to replace or reduce animal numbers and refinement of procedures as per NSW legislation.

These issues, together with the time frame for approval, especially in the beginning of semester, have placed additional pressure on all involved. Although the AEC meets monthly, it has been suggested that this is not frequent enough to deal with these applications.

The committee also has concerns about lines of responsibility for the project. The students are members of the institution and applications are signed by university delegated staff, however the conduct of the project is managed by external personnel (i.e. the client). Often this delegated university staff member does not have expertise in the project but is responsible for the administration of the unit or subject. Without a designated university staff member being identified, administration of the proposal becomes problematic. Students have transient association with the university and are unlikely to complete follow up paperwork and non-institutional applicants (i.e. the client) cannot be accommodated through the committee as it currently stands. Though The Code articulates that a formal agreement needs to be established for an AEC to deal with a non-institutional applicant, this is not practical given the volume of clients involved, the timeframe and the need to maintain the good-will between the client and the university.

As a consequence the committee relies on the disclosed expertise of the client nominated in the proposal and takes this on face value supported by the relationship of the staff member with the client. This not only involves the ability of the client to supervise and train students but that animal interactions and/or holding facilities are compliant with NSW Department of Primary Industry Codes of Practice/ guidelines or other reporting codes for the species involved. Thus the committee is asked to approve projects using animals outside their jurisdiction. Though this could be mediated by inspections, the travel distances and number of sites does not make it possible.

The university teaching staff perspective

Staff administering the project units are looking for educational outcomes to allow the student to move from being a novice to that of a professional in the industry. The outcomes centre on demonstrating not only research and animal behavioural assessment skills but also self responsibility and project management and communication skills. The majority of these teaching outcomes are being supported by interactions with the client rather than academic staff. This is due to the large numbers of students, some of whom require high levels of support but also the educational outcomes being sought. Academic staff also feel that there is a lack of incentive to be involved as they are often time poor and receive little peer appreciation or outcomes in a climate where personal careers are measured in publications and grant outcomes. This has been compounded by the increased pressure to reduce the number of practical or hands-on style units in favour of less face-to-face teaching with more innovative, flexible and online content, as well as ever increasing budgetary constraints. These pressures are sector wide and have been deemed as negative influences on other degrees, including Zoology at other universities, whereby practicals are deemed intensive in terms of staff time, potentially posing significant 'risk' due to the nature of the practical sessions and raise concerns regarding the use of animals for teaching purposes (Hochuli and Banks 2008).

Teaching staff are also expecting students to be exposed to Australian animal ethics requirements through the completion of the proposal application with guidance from academic staff. Often teaching staff are experienced in project teaching and student expectations but not the species of animals being used (this knowledge residing with the client) or in some cases the ethics approval process. They argue that there is a lack of training available,

though some are reluctant to engage with the training sessions that are run. They want ethics compliance with the minimal amount of paperwork and a clear delineation of the boundaries of their responsibility. The signing off on applications by the student, staff member, client and senior university executives also adds a time burden to the process. Some university staff are even reluctant to be involved as they see an adverse outcome putting at risk other higher stake teaching or research projects.

These issues increase pressure on staff to gain approval in a timely way so they do not disadvantage students in reducing the time spent on the project. In some cases this has led to staff and students submitting poor or incomplete applications which increases the timelines involved. Teaching staff are also frustrated with the need for projects to be approved at face to face meetings and often juxtapose the project approval process with undergraduate human ethics projects whereby no approval is required when publishing outcomes do not occur. Thus the animal ethics application process becomes perceived as more time consuming and problematic.

The students

Students are naive to the animal ethics process when they first are asked to complete a project application in an area they have only recently been introduced to. Students completing prior units, such as 'Animal Health and Welfare' are aware of the ethics requirements for research and teaching activities, however not all students enrol or attempt this unit and despite many students completing the unit, they still struggle when asked to complete the application form. Students are often looking for assistance from the academic staff member, as the client often has had no experience in animal research. The staff member however, as indicated above, may have limited knowledge of the species or facilities where the project is being undertaken. Students also do not realise the time pressures on the application process, given that they sometimes do not engage in the unit until the start of semester and may be waiting for several weeks to have a project assessed by the committee.

To address some of these issues early on in the project unit, a compulsory animal ethics workshop is conducted by an experienced animal researcher who has experience in writing a variety of different animal care and ethics applications. The staff member has been an AEC member at several institutions. The workshop consists of running through the basic requirements and then specifically going through each question on the animal ethics application form. Students are to attend this session if they believe they require animal ethics approval.

Despite the animal ethics workshop being compulsory for students who are going to be working with animals as part of their project, at times students perceive they will not require ethics approval to conduct their project and choose not to attend the workshop. In addition, in many cases the student's client has stated they can add the student to their animal research authority, thus the student does not perceive that they require animal ethics approval through the institution or the project changes during its development to require ethics approval. Later in the project, these issues become a major problem for the student, academic staff and often the AEC. The workshop aims to address these issues early on but is not fool proof.

During the workshop, students are able to ask any questions directly related to their project as they arise, whilst going through the application form together as a group. Students are encouraged to take notes regarding the requirements for each question. To accommodate students who may be shy or nervous specific questions are taken at the end of the session or via email if they require further information. Despite a high level of support provided often students need to acquire further information before completing the form and this may lead to information being missed or left out of the application, depending on who or where they source information.

Central questions raised during these discussions include what types of research require animal ethics approval. Often students who are very vocal at arguing for the need to maintain high ethical and welfare standards for animals cannot understand what equates to 'invasive animal research' in terms of animal ethics requirements, and cannot understand that even some very low impact activities require animal ethics approval. Spotlighting (the use of a filtered flashlights to cause nocturnal animals to stare into the light beam to aid identification) and call playback (use of recorded animal calls), for example, are invasive techniques, as they 'interfere' with the normal activity of an animal.

Despite these techniques being much less invasive than other forms of animal research such as directly capturing or holding and treating an animal in some form, students often perceive these techniques as non-invasive or not interfering with an animal. These arguments are not limited to this situation as McMahon et al (2012) recently argued that despite the public's increased awareness of fauna conservation they do not understand that to monitor animal populations it often involves utilising invasive techniques such as capturing, handling, tagging, banding or applying radio tracking equipment.

Prior to the student submitting the application, academic staff, clients and experienced animal researchers read the applications and provide feedback, however not all projects may have readers with expertise in the field and issues that academic staff and clients may not think is important, may be very important to the committee. This is perhaps also the time when further issues may arise and lead to increased time pressure due to the numbers of applications to review, the number of signatures required and waiting for any additional approvals such as Native Flora and Fauna Research or Fisheries NSW licences.

Some students equate the process of applying for an animal research authority with that of a traditional university assessment task, with a naive expectation of workload, resulting in time pressures. Though students gain experience in the application and amendment process, they become demoralised when changes are requested and this is often regardless of whether or not this delays applications. Often information requested may seem trivial to the student or academic staff which frustrates all involved.

The client

The projects offered by clients are often diverse both from the perspective of species being used and the setting in which the animal is held. Table 1 indicates some of the animals and projects that clients have offered to students in the past which have required ethics approval. It should be noted that a significant number of projects do not require animal ethics approval and most are of low to moderate risk with respect to animal welfare issues. Often they are with schedule 2 animals (primates or companion animals) which require supply exemptions to be endorsed by the committee.

Clients generally have no research background or knowledge of requirements by universities to meet animal ethics approval. However, they may be knowledgeable about other legislative requirements involving animals depending upon the primary purpose of the establishment. For example, the *Exhibited Animals Protection Act 1986* prescribes standards for exhibiting animals. Likewise, the client backgrounds are often diverse with varied research and supervisory experience. Though they may have experience in animal husbandry, handling and behaviour, they often have no understanding of the educational learning outcomes and standards expected.

As the client has identified the project with the view to enhance their practice they are interested in the outcomes of the project, however the enthusiasm does vary from client to client. Often the student and client relationship is more highly developed than that of the client and academic staff member, leading to students' relaying misinformation which can lead to confusion and frustration especially when incorporated into proposals. Again, these skills of negotiation and communication are learnt by the students throughout the project. The relationship building required may take time to develop, and in the worst case if insufficient, may impact on the student's ability to complete a successful AEC application.

Towards compliance - the UWS solution

Staff involved in managing and teaching the unit and the AEC have been working together to try and find solutions. Consultation also included presentation at Australian & New Zealand Council for the Care of Animal in Research and Teaching conference (Chuck, 2012) The stance the AEC has taken is that a university staff member must be named on the application form and should have some relationship with the client to verify the client's expertise and conditions of the facilities that the animals are being held. This needs to be verified to the committee via documentation of correspondence between the parties. The UWS staff member is therefore acting as a 'quasi' inspector for the committee and the university. In reality though, it is highly unlikely that the supervisor visits the site where the research project is taking place due to the expense that may be incurred and the time provisions required. Though this may be a conflict of interest, it is recognised that there is an element of trust in all ethics applications and project executions.

The committee then sees the client as the 'person in charge' of students as per the excerpt of The Code below. The committee assumes that The Code is compatible with the other legislative requirements and not putting the client, supervisor, student or university at risk. It is also assumed that the training and qualifications of the client are sufficient for the research being undertaken and they have enough experience to competently monitor the student within the approved activities of the proposal.

> *"Institutions must identify the person with ultimate responsibility for the care and use of animals in teaching activities. This person must:*
>
> * *ensure that all people involved in the care of animals understand and accept their role and responsibilities*
>
> * *ensure that procedures and resources are in place so that all people involved in the care and use of animals can meet their responsibilities*
>
> * *be competent with respect to the wellbeing of animals under their care."*

(The Code 4.4)

The committee is also aware of its role in training "ensuring all investigators are well informed of their responsibilities" though it is problematic at the undergraduate level. The students and staff treat the application as a mastery assessment task as the projects cannot proceed until approval, and delay threatens progress in the unit. Though students are trained in the application submission process through workshops and The Code via guest lectures by the chair of the AEC, the number of applications needing to be assessed in a very tight time frame negates the possibility of students attending the meeting to defend their applications and for responsibilities to be reinforced. This is something which is encouraged for postgraduate and staff applications with the view to educate and reduce tension when revisions are required. The committee also does not see its role as editing and reworking applications that are perceived to have not been adequately reviewed by staff. At UWS a similar scenario was occurring in the Human Ethics approval process for postgraduates and academic staff applications, whereby many unfunded project applications (i.e. no prior peer review) were not at an appropriate standard to be assessed by the committee. As a consequence school based sub-committees now vet applications for merit and integrity before being considered by the Human Ethics committee.

The committee is also moving to an online application process to reduce waiting times for low risk applications. Currently for low risk activities (e.g. observational studies with a risk rating of 2, or lower) this has occurred. This is to be supported by exemplars and information sheets and will reduce confusion about identifying projects which require approval and terminology such as 'death as an end point' which is often misinterpreted by applicants.

From the teaching perspective, we would like to see more school or department based workshops introduced and/or a peer review process developed before applications come to the committee. This review process may be supported by school staff who have served on the committee or have had previous applications assessed and thus have valuable expertise. The aim of such a committee would be to increase the quality of applications before being tabled at meetings, but also to aid in reinforcing the educational

outcomes afforded through the process of applying for animal care and ethics approval to students. Unfortunately, funding and available time for this activity is limited, and hence, is unlikely to gain support from the school.

Conclusions and Future Directions:

With the changing climate of the higher education sector, more students are being trained in professional competencies as part of their education. For animal science and zoology students this necessitates the use of animals in teaching. By working with staff whereby educational outcomes are not compromised and ethical compliance is upheld, we have worked towards a model whereby large numbers of different projects can go forward. It is however likely that in the future, time and budgetary constraints will place additional strains on the process and it will require further discussions between the committee, and academics within the school, to continue to maintain the high level of educational outcomes and meet the legal responsibilities of working with animals.

A recent paper by McMahon et al (2012) suggested animal-based researchers need to report all animal welfare findings in response to increased public awareness related to welfare implications, something that should be at the fore-front of the education of animal science graduates. The public is ever increasingly being exposed to examples of improper or highly questionable/debatable animal welfare situations (such as whale and dolphin slaughter, puppy farms, the use of sow gestational crates, battery hens, live export of sheep and cattle or inhumane slaughter of cattle, sheep and pigs) through the media and the internet. It is therefore essential that animal researchers, or future animal researchers, understand that working with animals usually involves 'invasive' techniques, no matter how trivial they may seem to the 'lay' person or first time applicant. An understanding of defining which techniques are 'invasive' and which are not, is a learnt skill and can even take active animal researchers sometime to become adept at determining.

By defining and communicating the level of invasiveness or risk to applicants, everyone will benefit from the development of resources that list a range of research activities regarded as 'non invasive' and require only an observational application to be completed, thus reducing time on completing lengthy applications by students and academic staff and that of the committee spent on assessing applications.

Likewise, clearer definitions may be required for ethical terminology to avoid confusion. As an example, the term 'death as an endpoint' may mean to the 'lay' reader that the animal is euthanised, however to an experienced animal researcher or animal care and ethics committee member this means the death of the animal is a deliberate measure of evaluating a response and different to humanely euthanising an animal (NHMRC, 2004).

Some other terms, ideas and examples could also be conveyed to first time applicants reducing the time spent on applying and assessing applications. Lunney (2012) for example has suggested defining the term 'animal use' and provided an example that compares experiments on a single sheep in a pen for one year compared to using over 100 possums in a one night spotlighting survey. This example easily conveys the differences that a committee may need to assess in terms of 'animal use' to a first time applicant. As the ethical process of approval of the use of animals is a course requirements or outcome, tying it to assessment is one way to increase the student's motivation to engage in the task more effectively as students traditionally gauge their success on a mark or grade.

At the UWS it is policy to provide students with feedback based on set criteria (i.e. criteria-based assessment). At present the process of applying for AEC approval is not an assessment task, however we believe students perceive it as one, as they need to complete this prior to continuing with their project task, and do not handle feedback well, regardless of the feedback provided by the committee. The feedback to students, academic staff and clients provided by the committee is not provided in the form that the students are familiar with i.e. criteria-based assessment. Further, an ethics committee can ask an applicant potentially a wide range of questions and do not need to justify why they are asking the question.

One way of potentially addressing the issue of adverse feelings towards committee feedback may incorporate a workshop on the types of feedback commonly provided by the committee, and the form in which they would expect to see the feedback, prior to the formal feedback being received by academic staff and students. A workshop of this kind may allay or reduce feedback being perceived as a negative outcome and reduce student anxiety (as suggested if a student were to obtain a low grade), as students need to understand that committee feedback is aimed at being constructive rather than negative and it is very rare for an application to be rejected outright. Students need to be given feedback (or understand a different form of feedback) that they can then recognise as being constructive, reflect on it and then action it, particularly if the experience is to be used as a learning activity.

In addition, the ethics web site may be able to supply additional information such as examples of successful and unsuccessful applications, and further information as to why the applications were regarded as such. A 'Frequently Asked Question' brochure may also aid in clearly defining some of the definitions and hence, aid the first time applicant. It is hoped that the use of an on-line form may also lead to less confusion, whereby applicants will not have access to questions which are not applicable to their project and the use of dropdown boxes can provide information in a clear in succinct manner.

Many of these suggestions relate to the enhancement of communication channels. These suggestions are more specific but similar to those described previously by Gott (1999) where she suggested AECs have unique opportunities to educate researchers in improving practice re: welfare, and should pass on their understanding and advice based on their experiences gained from reading and reviewing applications. The situation we describe is

not unlike those previously highlighted by Lunney (1999) where he questioned if ethics was opposed to science. When all the ideas are investigated and assessed it is clear everyone involved needs to engage in dialogue to streamline the process, where possible and improve outcomes for all. The relationship between the committee and student/academic staff/client is ever evolving and changing and every year brings a fresh cohort of eager students ready to undertake a broad range of animal-related projects. The relationship is also continuously placed under considerable time and budgetary constraints, however educating and increasing the awareness of requirements for both the committee, the students and academic staff will lead to better outcomes for all. It is an ongoing process and not an 'easy fix' in the short term but best dealt with by the use of open dialog, clear communication and increased education. In the future we hope to have streamlined the process further. It is hoped that this case study may be used by other institutions who maybe in similar situations.

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